

AMENDMENTS TO THE CLAIMS

Kindly cancel claims 7, 16 and 18 and amend claims 1, 5, 8, 10, 12, 13 and 14. This listing of claims will replace all prior versions, and listings of claims in the application.

LISITING OF CLAIMS

1 Claim 1 (currently amended). A parallel plate diode, comprising:

2 two thin plate metal electrodes and a semiconductor materials material layer
3 contacting said metal electrodes, wherein the two thin plate metal electrodes ~~made of~~
4 ~~metal are~~ disposed in parallel, wherein and a layer of thin plate the semiconductor
5 material layer is sandwiched between the two thin plate electrodes, wherein the
6 concentration of the carriers in the semiconductor material layer is 20% or less than that
7 of the electrons in the metal, one of the metal electrodes is made so as to have a
8 plurality of recesses from its surface into the interior on the side that faces the
9 semiconductor ~~coat~~ material layer, wherein the diameter of those recesses is less than
10 4 micrometers.

1 Claim 2 (original). The parallel plate diode according to claim 1, wherein said recesses
2 are well-shape cavities.

1 Claim 3 (original). The parallel plate diode according to claim 2, wherein said cross
2 section of the well-shape cavity is a circular, a square, rectangle or an irregular curve.

1 Claim 4. (original) The parallel plate diode according to claim 2, wherein said cross
2 section of the well-shape cavity is groove-shape.

1 Claim 5 (currently amended). The parallel plate diode according to claim 2, wherein said
2 cross section of the well-shape cavity is in the form of an array of ~~projections in which~~
3 convex portions and concave portions ~~are staggered each other.~~

1 Claim 6. (original) The parallel plate diode according to ~~previously any one of claims~~
2 claim 1, 2, 3, 4, or 5, wherein said two walls of the well-shape cavity or groove-shape
3 are made of two substances, $\epsilon\Phi_1$ and $\epsilon\Phi_3$ respectively represent the power function of
4 the two walls of the well cavity, they satisfy the following relation:

$$\Phi_1 < \Phi_3$$

1 Claim 7 (cancel)

1 Claim 8. (currently amended) The parallel plate diode according to claim 1, wherein said
2 parallel plate diode is attached to ~~[[the]]~~ an insulated substrate.

1 Claim 9. (original) The parallel plate diode according to claim 8, wherein said parallel
2 plate diode is attached to a glass substrate.

1 Claim 10. (currently amended) The parallel plate diode according to claim 9, wherein
2 ~~[[said]]~~ the metal electrode having the well-shape cavity of each diode is coupled to
3 ~~[[the]]~~ a germanium electrode of ~~[[the]]~~ an adjoining diode having the same structure,
4 thus forming a parallel plate diode in series structure.

1 Claim 11 (previously presented). The parallel plate diode according to claim 1, wherein
2 one or more of said metal electrodes is made ~~by kovar alloy~~ from an alloy of iron, nickel
3 and cobalt having a thermal expansion coefficient of about 3×10^{-6} .

1 Claim 12 (currently amended). The parallel plate diode according to claim 11, wherein
2 said each of the metal ~~kevar-alloy~~ electrodes ~~having~~ has one or more well-shape
3 cavities, the well-shape cavities of the two electrodes having identical structures so that
4 they can be joined together to ~~of such diodes can join the kevar-alloy substrate of the~~
5 ~~other diode having identical structure so that they~~ form a parallel plate diode in series.

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cont: 1 Claim 13 (currently amended). The parallel plate diode according to claim 1, wherein
2 there are recesses on the ~~surface~~ surfaces ~~[[where]]~~ wherein the two metal electrodes
3 that make up the parallel plate diode contact the semiconductor material, and wherein
4 the average diameter of the recesses on one side of the semiconductor material is
5 equal to or smaller than 0.7 micrometer while the average diameter of the recesses on
6 the other side is bigger than 0.7 micrometer.

1 Claim 14 (currently amended). The parallel plate diode according to claim 13, wherein
2 ~~[[said]]~~ the surface of the two electrodes have recesses with different depths.

1 Claim 15. (original) The parallel plate diode according to claim 13, wherein said the
2 surface of the two electrodes have recesses with different shape.

1 Claim 16 (cancel)

1 Claim 17 (previously presented). The parallel plate diode according to claim 1, wherein
2 said semiconductor material is liquid semiconductor material.

1 Claim 18 (cancel)
